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Room 307

8TH FLOOR
1100 NORTH GLEBE ROAD
ARLINGTON, VIRGINIA 22201-4714

STATUS AND ENTRY
NIXON & VANDERHUYE P.C.
APR 26 PM 5:00 BYS AT LAW

April 20, 2004

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Subject: **REQUEST FOR REFUND TO DEPOSIT ACCOUNT**
Deposit Account No. 14-1140
Statement Date: April 5, 2004
Date Posted: March 10, 2004
Control No.: 2
Fee Code: 1201; \$344.00
Our Ref.: 2635-22

To whom it may concern:

Regarding the Monthly Statement of Deposit Account dated April 5, 2004, (copy attached), we believe there is a fee related error therein, which has resulted in a charge to our Deposit Account that appears to be unwarrented. Please refer to the following explanation and issue a refund as soon as possible.


We filed an RCE application on September 8, 2003 together with an amendment adding new claims 9 through 20. We paid \$334.00 for the extra claim fee (\$84.00 for each additional independent claim) which was the correct amount at that time. Therefore please refund our Account No. 14-1140 in the amount of \$344.00. Our cover sheet to the USPTO, preliminary amendment and postcard receipt are attached for your review.

Thank you for your time and assistance, and if you have any questions, please do not hesitate to call me at the above number.

Very truly yours,

NIXON & VANDERHUYE P.C.

By:


Larry S. Nixon

LSN:vc
Enclosures

Adjustment date: 06/08/2004 EEKUBAY1
03/10/2004 RGRADEN 00000002 141140 09885023
01 FC:1201 344.00 CR

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03/09 475	10203007	1001	1001	\$100.00	\$7,781.25
03/09 476	10182003	1001	1001	\$100.00	\$7,781.25
03/09 477	10203007	1001	1001	\$100.00	\$7,781.25
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03/12 18	PAYMENT	1004	1004	-\$15,000.00	\$19,800.00
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03/18 2	09497552	1001	1001	\$100.00	\$19,805.36
03/18 3	09497552	1001	1001	\$100.00	\$19,805.36

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REQUEST

TRANSMITTAL

Submission (b) of 37 C.F.R. § 1.128, which provides for continued examination of an application, should be filed with this request. See The American Inventor's Protection Act.

This is a Request for Continued Examination (RCE) under 37 C.F.R. § 1.128.

NOTE: 37 C.F.R. § 1.128 is effective on 10/1/90. Consider filing a continuation-in-part application if you are not filing an RCE. (See 37 C.F.R. § 1.101 for more information.)

1. Submission required under 37 C.F.R. § 1.128

- a. ☐ Previously submitted
- i. ☐ Consider the amendment to the claims (Any amended claim(s) must be clearly identified.)
- ii. ☐ Consider the arguments in support of the claims (Any amended claim(s) must be clearly identified.)
- b. ☒ Enclosed
- i. ☒ Amendment/Reply
- ii. ☐ Affidavit(s)/Declaration(s)
- iii. ☐ Information Disclosure Statement(s)
- iv. ☒ Other Figures & etc.

2. Miscellaneous

- a. ☐ Suspension of action on the application for a period of _____
- b. ☐ Other _____

3. Fees

- The RCE fee under 37 C.F.R. § 1.171 is required. The fee is \$100.00. (See 37 C.F.R. § 1.171 for more information.)
- a. ☒ The Director is hereby authorized to debit the fee from the inventor's Deposit Account No. 14-1280.
- i. ☒ RCE fee required under 37 C.F.R. § 1.171
- ii. ☒ Extension of time fee under 37 C.F.R. § 1.171
- iii. ☒ Other Additional Information
- b. ☒ Check in the amount of \$100.00 for independent claims (2) and dependent claims (2).

Name (Print Type)

Signature

I hereby certify that this correspondence is being filed in an envelope addressed to: Mail Stop RCE, Communications Division, Patent and Trademark Office on:

Name (Print Type)

Signature

Caution: This form is subject to the provisions of 37 C.F.R. § 1.128. If you are required to submit a fee, you must submit it with this form. DO NOT SEND THIS FORM TO THE PATENT AND TRADEMARK OFFICE. Please, Mail RCE, P.O. Box 1400, Alexandria, VA 22304-1400.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

STATUS: AMENDED
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APR 26 PM 3:20

KIMATA et al.

Appl. No. 09/885,023

Filed: June 21, 2001

For: GAS SENSOR

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir,

In response to the Office action dated April 6, 2001, regarding the
above-identified application, we hereby submit the following:

AMENDMENTS TO THE CLAIMS

2001 APR 26 PM 3:21

This listing of claims was amended to add new claims, and changes to claims in the application:

1. (Currently Amended) A gas sensor comprising a cylindrical isolator having an element insertion hole extending from a proximal end to a distal end thereof, a gas sensing element airightly disposed within the insertion hole of the isolator, and a cylindrical housing having an outer surface surrounding said isolator, with an air side cover attached to a proximal end thereof so as to confine an inert atmosphere therein and a measured gas side cover attached to a distal end of said housing so as to confine a measured gas atmosphere therein.

a sealing material is provided at a proximal end of said element insertion hole for sealing a clearance between an inner surface of said element insertion hole and an outer surface of said isolator, and

a cushion filler is provided at a distal end of said element insertion hole for sealing a clearance between an inner surface of said element insertion hole and the outer surface of said isolator.

2. (Previously Amended) A gas sensor as recited in claim 1, wherein a filling percentage of said cushion filler in the measured gas side cover of said element insertion hole and the cushion filler in the inert atmosphere side cover is in the range from 10% to 80%.

3. (Original) The gas sensor assembly of claim 1, wherein an injection port is provided near an open end of said element insertion hole at the distal end of said insulator for facilitating a flow of said sealing material or said cushion filler.

4. (Original) The gas sensor assembly of claim 1, wherein said element insertion hole comprises a large-diameter portion and a smaller-diameter portion, and an inner diameter of said large-diameter portion is larger than that of said smaller-diameter portion.

5. (Original) The gas sensor assembly of claim 1, wherein said sealing material and/or said cushion filler is disposed to fit at least two opposed surfaces of the inner surface of said element insertion hole and the outer surface of said gas sensing element.

6. (Currently Amended) A gas sensor assembly comprising a cylindrical insulator having an element insertion hole extending from a proximal end thereof, a gas sensing element airtightly fixed to said element insertion hole of the insulator, and a cylindrical housing having an outer diameter larger than that of said insulator, with an air side cover attached to a proximal end of said housing so as to confine an axial atmosphere therein and a measured gas side cover attached to a distal end of said housing so as to confine a measured gas atmosphere therein.

a sealing material is provided in a circumferential region of said element insertion hole for sealing a clearance between an inner surface of said element insertion hole and an outer surface of said gas sensing element;

a cushion filler is provided in a circumferential region of said element insertion hole for sealing a clearance between an inner surface of said element insertion hole and the outer surface of said gas sensing element;

said insulator constitutes a main body and a separate body attached via a spacer to a distal end of said main body, and said element insertion hole extends across both of said main body and said separate body;

said cushion filler is provided in said element insertion hole of said separate body.

7. (Previously Presented) A gas sensor as defined in claim 1, said cushion filler being capable of withstanding a load of from 50 to 1,000 N.

8. (Previously Presented) A gas sensor as defined in claim 6, said cushion filler being capable of withstanding a load of from 50 to 1,000 N.

9. (New) A gas sensor comprising:
a cylindrical insulator having an element insertion hole extending through its central region;

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a gas sensing element secured to said element insertion hole and being
securely fixed to opposite ends of said cylindrical insulator to prevent said gas sensing
element from swinging within said cylindrical insulator, and

a cylindrical housing having an inner space for receiving said cylindrical
insulator and said gas sensing element, with an air side cover attached to a proximal
end of said housing so as to confine a measured atmosphere therein and a measured gas
side cover attached to a distal end of said housing so as to confine a measured gas
atmosphere therein.

10. (New) A gas sensor as provided in claim 9, further including a sealing
material provided at one end of said element insertion hole for securely fixing said gas
sensing element to said cylindrical insulator and for sealing a clearance between an
inner surface of said element insertion hole and an outer surface of said gas sensing
element.

11. (New) A gas sensor as provided in claim 10, further including a cushion filler
provided at an end opposite to said one end of said element insertion hole for securely
fixing said gas sensing element to said cylindrical insulator and for sealing a clearance
between an inner surface of said element insertion hole and the outer surface of said
gas sensing element.

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12. (New) A gas sensor as recited in claim 11, wherein a filling percentage of said cushion filler provided between an inner surface of said element insertion hole and the outer surface of said gas sensing element is in the range from 10% to 80%.

13. (New) The gas sensor in accordance with claim 11, wherein an injection port is provided near an open edge of said element insertion hole at the distal end of said insulator for facilitating a filling operation of said sealing material or said cushion filler.

14. (New) The gas sensor in accordance with claim 9, wherein said element insertion hole comprises a large-diameter portion and a smaller-diameter portion, and an inner diameter of said large-diameter portion is larger than that of said smaller-diameter portion.

15. (New) A gas sensor comprising:
a cylindrical insulator having an element insertion hole extending through its central region;

a gas sensing element disposed within the element insertion hole and being securely fixed to opposite ends of said cylindrical insulator to prevent said gas sensing element from swinging within said cylindrical insulator;

a cylindrical housing having an inside space for receiving said cylindrical insulator and said gas sensing element, with an air side cover attached to a proximal end of said housing so as to confine an outer atmosphere therein and a measured gas

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side cover attached to a distal end of said housing so as to confine a measured gas atmosphere therein; and

wherein said insulator constitutes a main body and a separate body attached via a spacer to a distal end of said main body, so that said element insertion hole extends across both of said main body and said separate body.

16. (New) A gas sensor as claimed in claim 15, further including a sealing material provided at one end of said element insertion hole for securely fixing said gas sensing element to said cylindrical insulator and for sealing a clearance between an inner surface of said element insertion hole and an outer surface of said gas sensing element.

17. (New) A gas sensor as claimed in claim 16, further including a cushion filler provided at an end opposite to said one end of said element insertion hole for securely fixing said gas sensing element to said cylindrical insulator and for sealing a clearance between an inner surface of said element insertion hole and the outer surface of said gas sensing element.

18. (New) A method for protecting a gas sensing element of a gas sensor assembly by fixedly securing said gas sensing element at opposite ends of a central bore hole disposed within a cylindrical insulator, thereby preventing said gas sensing element from swinging within said cylindrical insulator, after said gas sensing element and cylindrical insulator are assembled within a housing of the gas sensor assembly.

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19. (New) An improvement for a gas sensor having an elongated gas sensing element mounted within and extending through an elongated aperture of an insulating member, said elongated aperture having a first larger cross-section portion axially spaced from a second relatively smaller cross-section portion and wherein said gas sensing element is fixedly sealed in a gas-tight manner within said larger cross-section portion using a sealing material, said improvement comprising:

a cushion material, softer than said sealing material, disposed within said smaller cross-section portion of the aperture and between the insulating member and the gas sensing element.

20. (New) A method for protecting a gas sensor having an elongated gas sensing element mounted within and extending through an elongated aperture of an insulating member, said elongated aperture having a first larger cross-section portion axially spaced from a second relatively smaller cross-section portion and wherein said gas sensing element is fixedly sealed in a gas-tight manner within said larger cross-section portion using a sealing material, said method comprising:

providing a cushion material, softer than said sealing material, within said smaller cross-section portion of the aperture and between the insulating member and the gas sensing element.

KIMATA et al.
Appl. No. 09/885,023
September 8, 2003

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AMENDMENTS TO THE DRAWINGS

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The attached sheets of drawings includes changes to Figs.8 and 12 as required by the Examiner in the Office Action. These sheets, which includes Figs.8 and 12, replace the original sheets including Fig.8 and 12.

Attachment: Replacement Sheet(s)

REMARKS/ARGUMENTS

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Claims 1-20 stand in the present application, claims 1 and 6 having been amended and new claims 9-20 having been added. Applicants note with appreciation the Examiner's indication of allowable subject matter in claim 3, but respectfully submit that in view of the above amendments and the following remarks that all of the claims standing in the application are in condition for allowance.

As required in the Office Action, revised Figures 8 and 12 are submitted herewith.

The Examiner has rejected claims 1, 2, 4, 5 and 7 under 35 U.S.C. § 103(a) as being unpatentable over Noda and has rejected claims 6 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Noda in view of Kuisell. Applicants respectfully traverse the Examiner's § 103 rejections of the claims.

Applicants' invention is directed to a gas sensor having a gas sensing element fixed at both ends of a cylindrical insulator – at the proximal end with sealing material and at the distal end by a soft cushion filler. Prior art devices only fixed the gas sensing element at one end of the insulator. An important feature of Applicants' invention is the additionally fixed end, preferably by use of the soft cushion filler which allows for shocks applied from the outside to be absorbed. As a result, the gas sensing element is prevented from being directly subjected to shocks transmitted from outside of the gas sensor.

More particularly, Applicants' gas sensing element is held at both its proximal and distal ends. Therefore, the gas sensing element does not swing like a pendulum when receiving shocks or vibrations. Accordingly, Applicants' invention prevents a

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concentrated stress from acting on a portion serving as a swing center of the gas sensing element (i.e., a portion immediately below the portion firmly fixed with the sealing material) and also prevents the gas sensing element from colliding with the inner surface of the insulator. Therefore, the present invention effectively prevents the gas sensing element from easily cracking or breaking. Applicants have amended independent claims 1 and 6 to more clearly recite that the sealing material and cushion filler are respectively disposed at opposite ends of the element insertion hole, i.e., the proximal and distal ends of the element insertion hole.

Neither Noda nor Kuisell teaches or suggests a claimed cushion filler, or any other material, provided at the opposite (or distal end) of the element insertion hole for sealing a clearance between an inner surface of the element insertion hole and the outer surface of the gas sensing element. As clearly shown in Figure 1 of Noda, both the sealing element 32 and cushion element 34 are disposed at the same end (proximal end) of the element insertion hole. Indeed, sealing element 32 and cushion layer 34 are shown to be abutting at one end of insulator 4. This arrangement, of the sealing element 32 abutting against the cushion layer 34 at one end of the insulator 4, is also described in the cited reference at, *inter alia*, the Abstract and column 3, lines 3-20. Thus, Noda will suffer the same disadvantages as the prior art devices described in the present application at pages 1 and 2 with reference to Figure 13.

Kuisell has merely been cited by the Examiner for teaching "a gas sensor having an insulator comprised of separate bodies attached at their ends by a glass spacer (Figure 1)." Accordingly, it should be clear that Kuisell does not solve the deficiencies noted above with respect to Noda.

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Hence, unlike Applicants' invention, the gas sensing elements disclosed in these references will exhibit a swinging motion like a pendulum, when shocks or vibrations are received, and, therefore, will tend to crack or break. Accordingly, claims 1-6 which now more clearly recite that the sealing material and cushion filler are disposed at opposite ends of the insulator, and their respective dependent claims are believed to patentably define over the cited references taken either singly or in combination.

Newly added claims 9-18 also recite the above-described patentable distinction over the cited art. More particularly, newly added independent claims 9 and 16 are directed to gas sensors in which the gas sensing element is securely fixed at opposite ends of a cylindrical insulator. Newly added independent claim 18 recites a method for protecting a gas sensing element of a gas sensor assembly by fixedly securing the gas sensing element at opposite ends of a central bore hole disposed within a cylindrical insulator. Accordingly, all of newly added independent claims 9, 16 and 18 and their respective dependent claims are believed to patentably define over the cited references, taken either singly or in combination, for the same reasons given above with respect to claims 1 and 6.

Newly added claims 19 and 20 are directed to apparatus and method wherein a sealing material is disposed in the larger cross-sectional area of an elongated aperture, through which the gas sensing element is mounted, and a cushion material is disposed in the smaller cross-sectional portion of the elongated aperture. Since the cited art does not teach or suggest placing a cushion material in the smaller cross-section of the elongated aperture of an insulator, these claims are also believed to patentably define over the cited art.

KIMATA et al.
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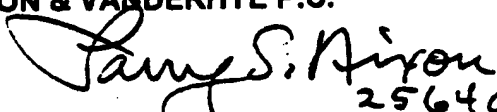
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Therefore, in view of the above amendments and remarks, it is respectfully
requested that the application be reconsidered and that all of claims 1-20, now standing
in the application, be allowed and that the case be passed to issue. If there are any
other issues remaining which the Examiner believes could be resolved through either a
supplemental response or an Examiner's amendment, the Examiner is respectfully
requested to contact the undersigned at the local telephone exchange indicated below.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By:


25640
for Chris Comuntzis
Reg. No. 31,097

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